UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

September 12, 1997

Baldwin Park Operable Unit Steering Committee
c/o Donald E. Vanderkar, Steering Committee Co-Chair
Aerojet General Corporation
Box 13222
Sacramento, CA 95813

Subject: EPA Review of Phase 1 Treatability Study Work Plan, Perchlorate in Groundwater, Baldwin Park Operable Unit, San Gabriel Basin, dated August 26, 1997

Dear Mr. Vanderkar:

We have completed our review of the August 26, 1997 Treatability Study Workplan. Our comments, which are relatively minor, are provided as an enclosure. Please respond to the comments by submitting a revised workplan or an addendum to the workplan.

Please proceed immediately to implement the workplan. Contact me at (415) 744-2256 with any questions or comments.

Sincerely,

Wayne Praskins
EPA Project Manager

Enclosure

EPA COMMENTS ON AUGUST 26, 1997 TREATABILITY STUDY WORKPLAN

Page/ Column/ Section	Comment
page 3/ column 2/ section 2.3	Please identify the "higher than normal level of quality control precautions" that will be taken.
page 7 / column 2/ section 4.2	Please specify the perchlorate concentration or concentration range that is "representative of that anticipated in San Gabriel Basin."
page 7/ column 2/ section 4.3	We understand that biological denitrification has been used directly on a drinking water system in France in a 5 MGD system, and indirectly on a drinking water supply in El Paso, Texas.
page 8/ column 1/ section 4.3	Please specify the nitrate concentration or concentration range that is "similar to that expected in San Gabriel Basin."
page 8/ column 1/ section 4.5	We expect that phase 2 testing can begin earlier than April 1998. As explained in the EPA letter dated 8/28/97, we expect that the Steering Committee will submit the following documents within 75 calendar days of EPA approval of the workplan: a written phase 1 progress report for treatability testing of the biological process that includes a description of and schedule for the remaining phase 1 testing and either: (i) a supplemental workplan for phase 2 treatability studies; or (ii) a detailed explanation why additional phase 1 testing is necessary before preparation of a phase 2 workplan and planned submittal date for the phase 2 workplan.

page 8/ column 2/ section 4.5	One of the objectives listed for phase 2 is to evaluate the relative bacterial preference for perchlorate and nitrate. The treatability study should examine other parameters relevant to microbially-catalyzed oxidation-reduction reactions, including the presence and depletion of competing electron acceptors. Measurement of these parameters may provide information that can be used to optimize removal rates, reduce operating costs, and diagnose the cause of lower than expected perchlorate removal rates. These processes are commonly examined during evaluations of biological degradation and natural attenuation in groundwater (e.g., see *Technical Protocol for Natural Attenuation of Chlorinated Solvents in Groundwater*, by T.H. Wiedemeier et. al.). Parameters commonly measured during studies of biological degradation and natural attenuation include: * iron II (Fe^{+2}) - reaction product for competing redox reaction (iron reduction) * sulfate and sulfide - competing electron acceptor and reaction product (sulfate reduction) * methane - reaction product for competing redox reaction (methanogenesis) * oxidation-reduction potential - indicator of type of redox reactions that may occur. Consideration should also be given to measurement of additional chlorine compounds, and preparation of a mass balance of all chlorine species, in order to determine whether the perchlorate is fully reduced to chloride. Other possible chlorinated products include chlorate, chlorite, and hypochlorite.
Figure 5-1	The photograph of the pilot unit shows an air compressor, oxygen generator, bubble contactor, and dissolved oxygen control meter. Presumably, these will not be used during the treatability study.
Figure 5-2	The Process and Instrumentation Diagram also shows an Oxygen Generation System and recycling line. Please correct the diagram or explain the need for this equipment. Also, please add other system components described elsewhere in the workplan (e.g., air stripper, filters, effluent pumps, recycle line, backwash line, backwash pumps, effluent equalization tank, 20,000 gallon storage tank, sample ports).
page 8/ column 2/ section 5.0	Should tests also be conducted in reverse order: through the biological unit first, followed by air stripping? Isn't the biological process likely to remove some of the VOCs, offering the potential to reduce air stripping and/or offgas control costs?

page 9/ column 2/ section 5.0	Will the methanol in denatured alcohol limit the end use of the water? Should methanol be analyzed for in the effluent? Water temperature should be measured, given the potential temperature dependence of reaction rate. If the water temperature in the reactor may be cooler than San Gabriel basin groundwater (as implied by need for heat tracing on the filtration line), should water temperature be adjusted? The text describes the effluent being discharged into a 550 gallon equalization tank. Is this tank for solids removal? Figure 5-2 shows an equalization separation tank on the influent line. What is the purpose of this tank?
page 10/ column 2/ section 6.1	Should the expected organic loading rate reflect the difference in perchlorate concentration between Sacramento and Baldwin Park? The workplan states that "targeted analytical parameters will be measured after each change in operating conditions." How long is needed for stabilization - minutes or hours? Perhaps a parameter vs. time curve should be generated to determine the optimal time for sample collection after a change in operational conditions.
page 11/ column 1/ section 7.1	The workplan states that DO concentrations in the influent and effluent of the GAC/FB system will be monitored daily. We assume that these measurements will be made at sample ports located on the influent and effluent lines immediately adjacent to the reactor vessel. Please show the locations of the recycle line and sample ports on Figure 5-2.
page 11/ column 2 / section 7.2	The source water for the treatability testing should be sampled for anions, metals, general water chemistry, and other parameters that might affect system performance. Why collect the effluent ethanol samples as composites rather than grab samples?
page 12/ column 1/ section 7.3	The list of analytes should include parameters mentioned in the comment on page 8, column 2, section 4.5.
page 12/ column 2/ section 10.0	The schedule should be modified as explained in the comment on page 8, column 1, section 4.5.